

Appl. No. 09/783,034; Filed: February 15, 2001
 Art. No. 1875.0210000; Group Art Unit: 2826
 Inventor(s): Khan *et al.*; Tel: 202/371-2600
 Title: Die-Down Ball Grid Array Package With Die-Attached Lead Spreader and Method For Making the Same

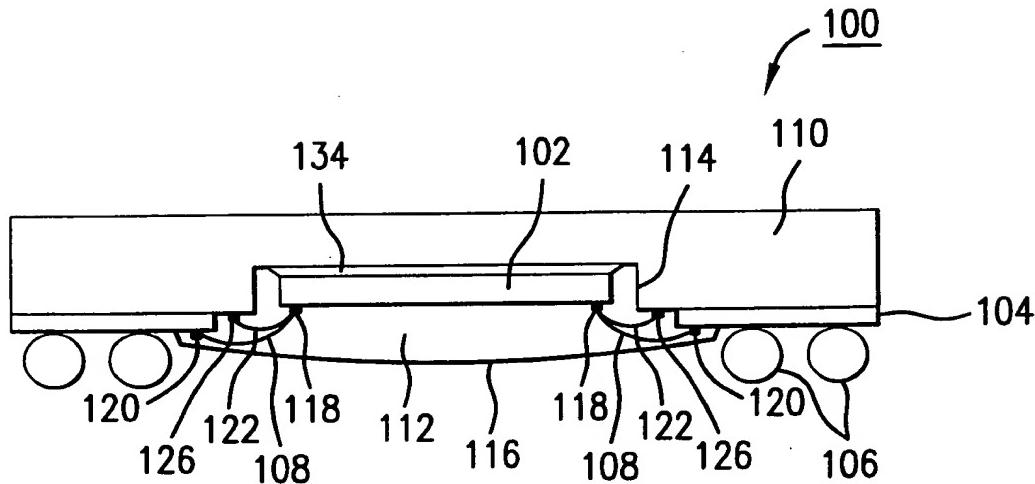


FIG. 1A

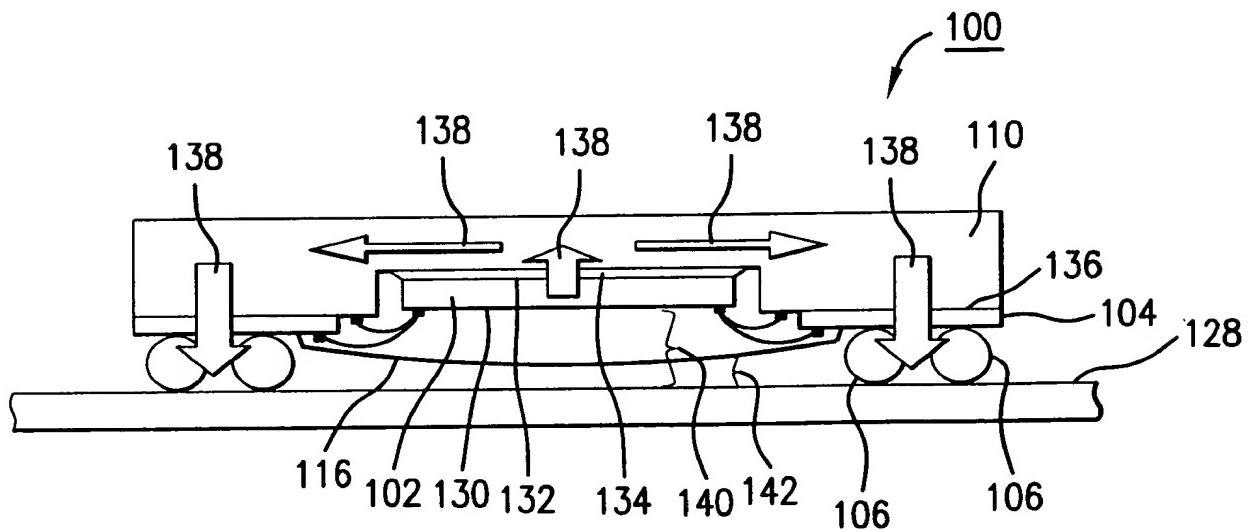
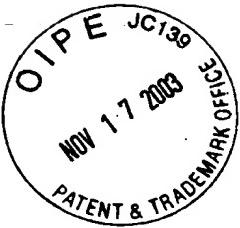


FIG. 1B



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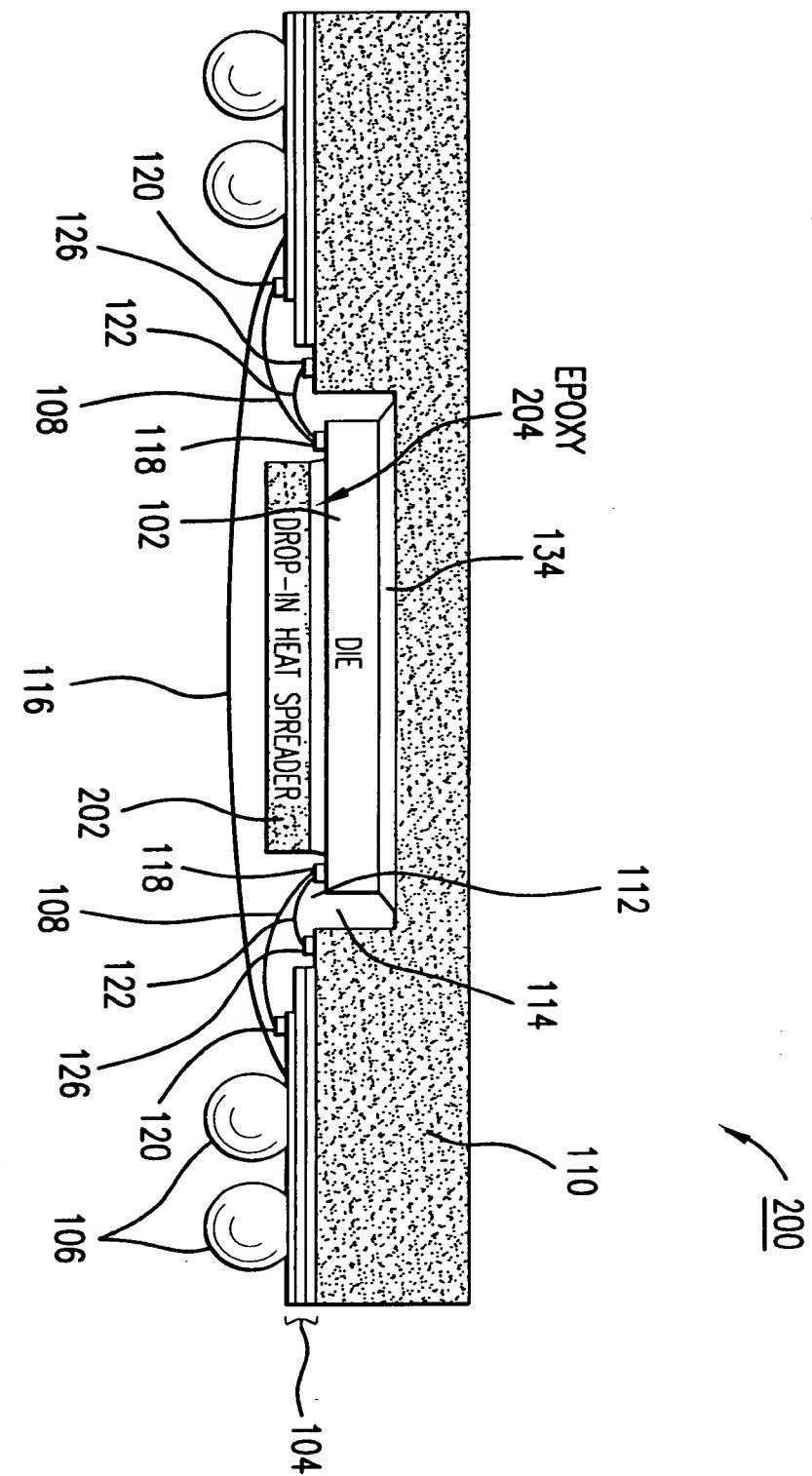


FIG. 2A

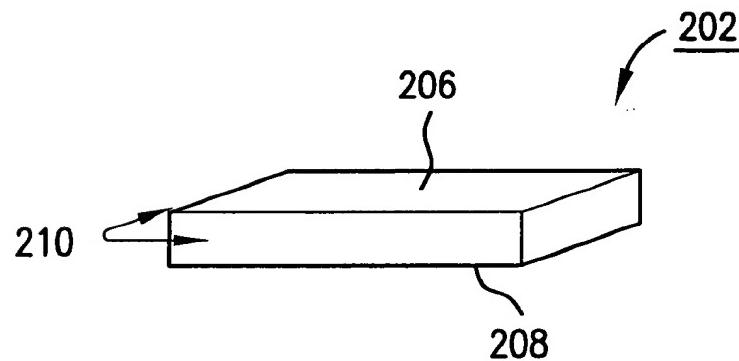


FIG. 2B

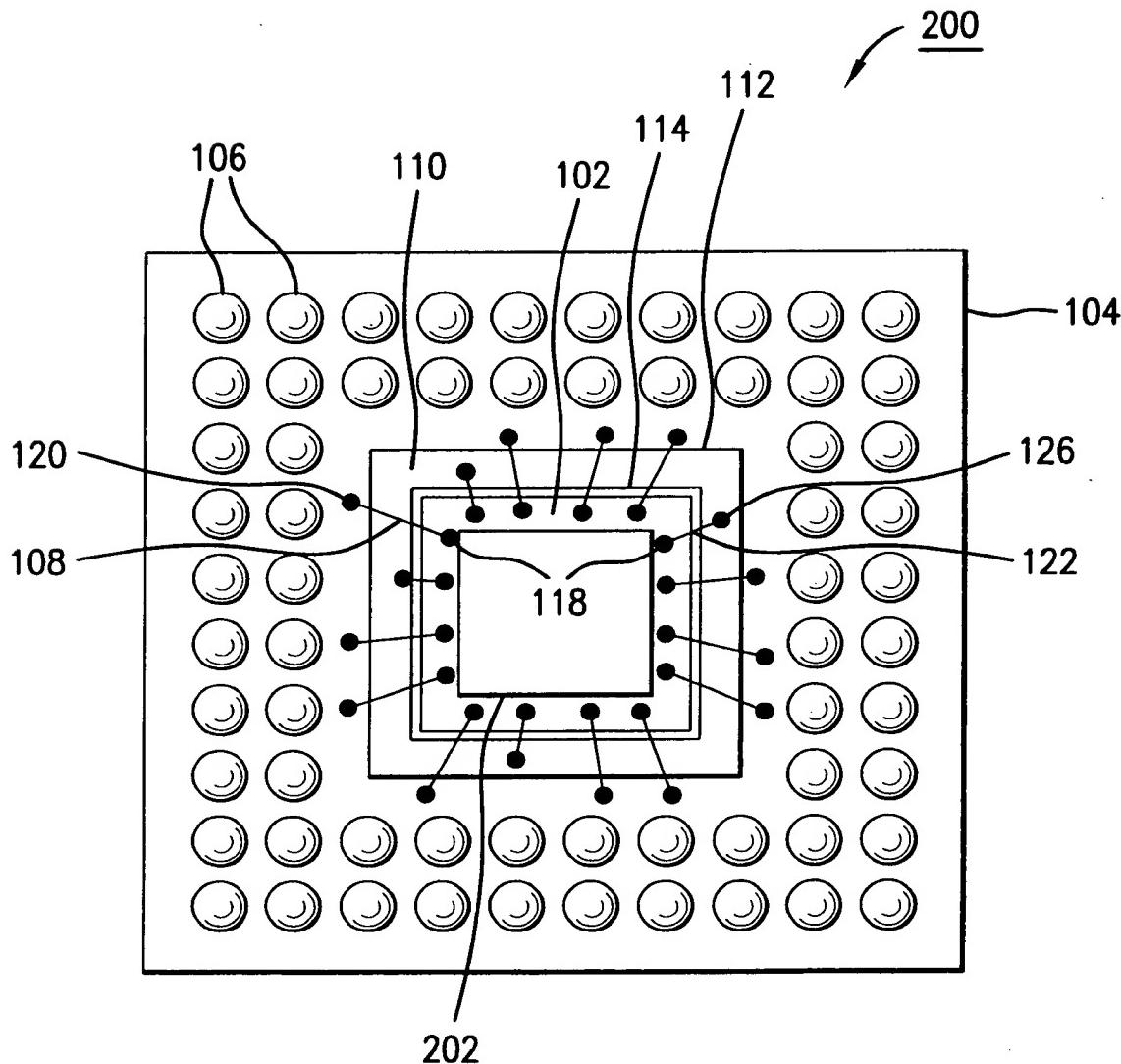


FIG. 2C

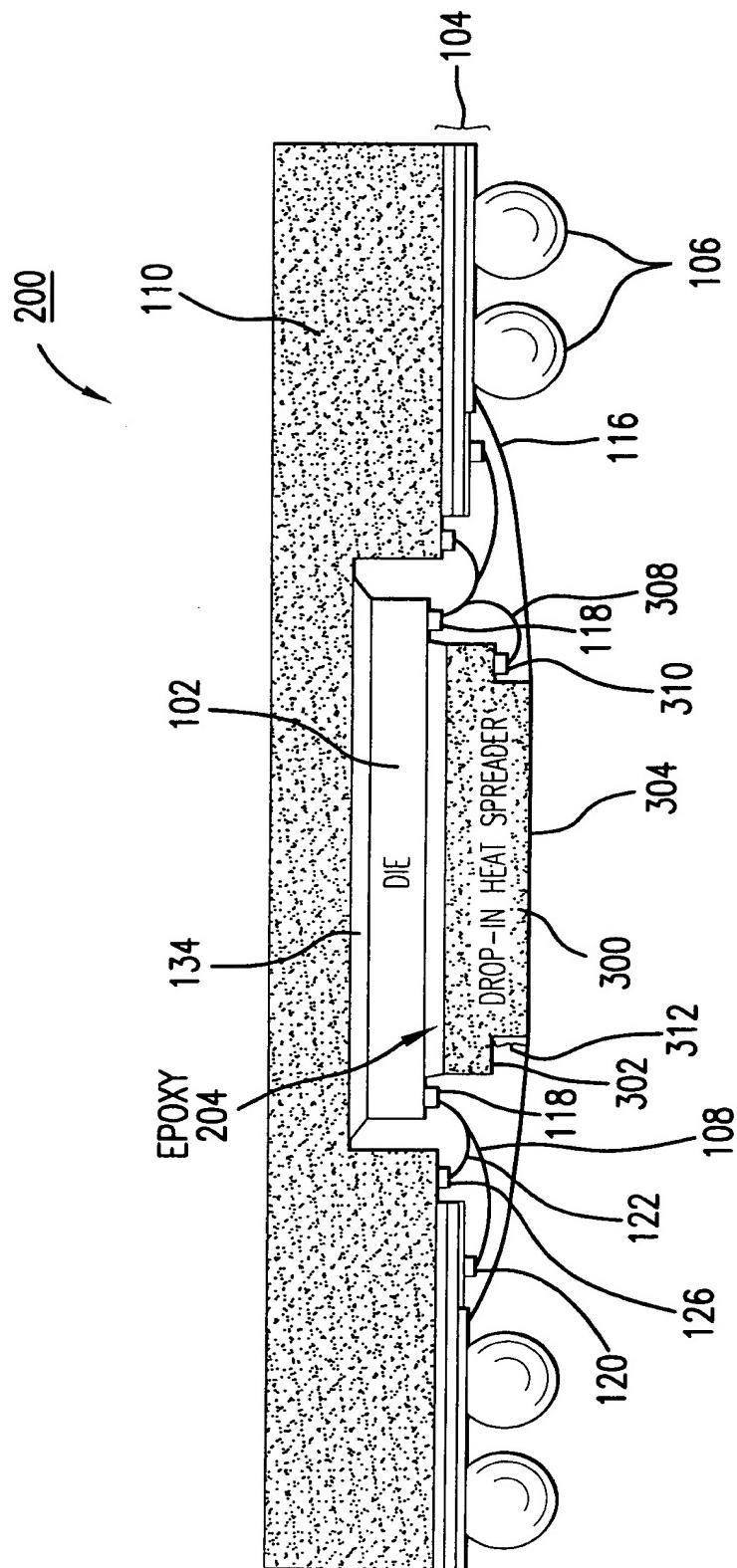


FIG. 3A

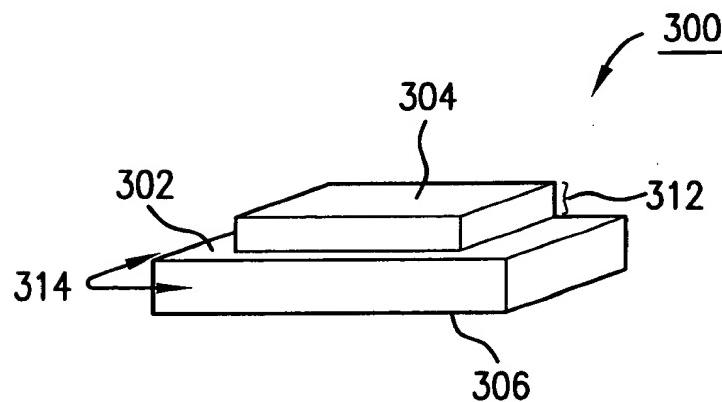


FIG. 3B

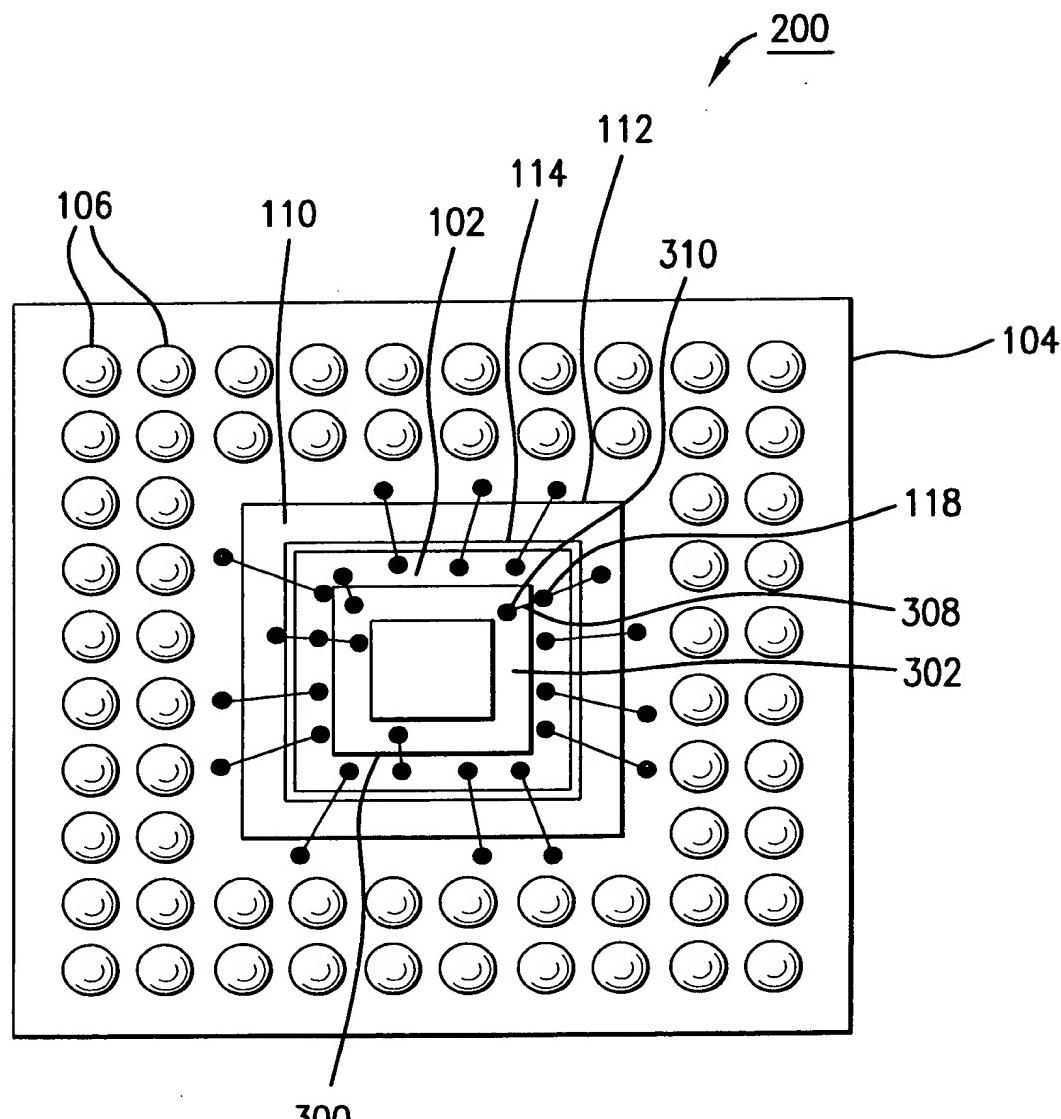


FIG. 3C

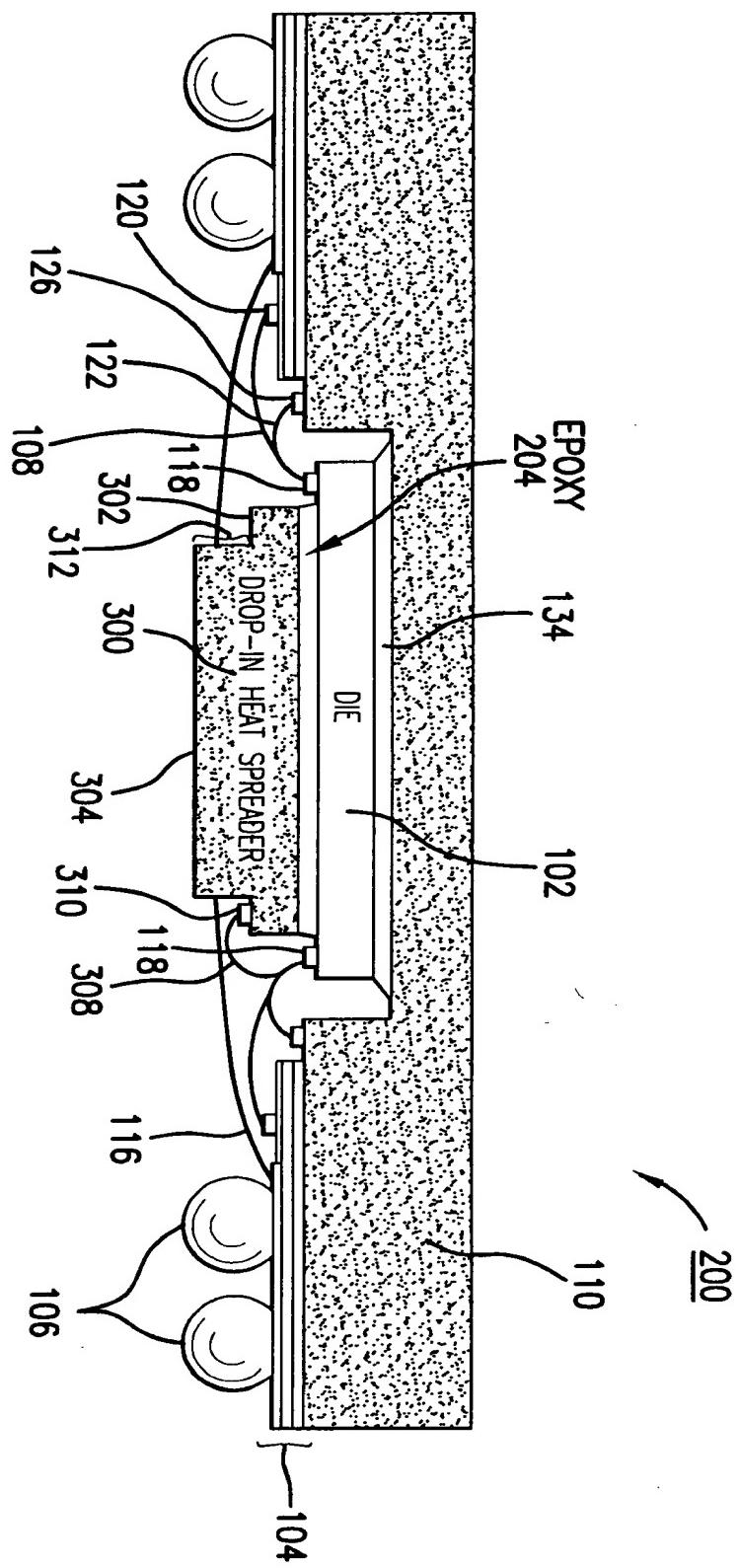


FIG. 3D



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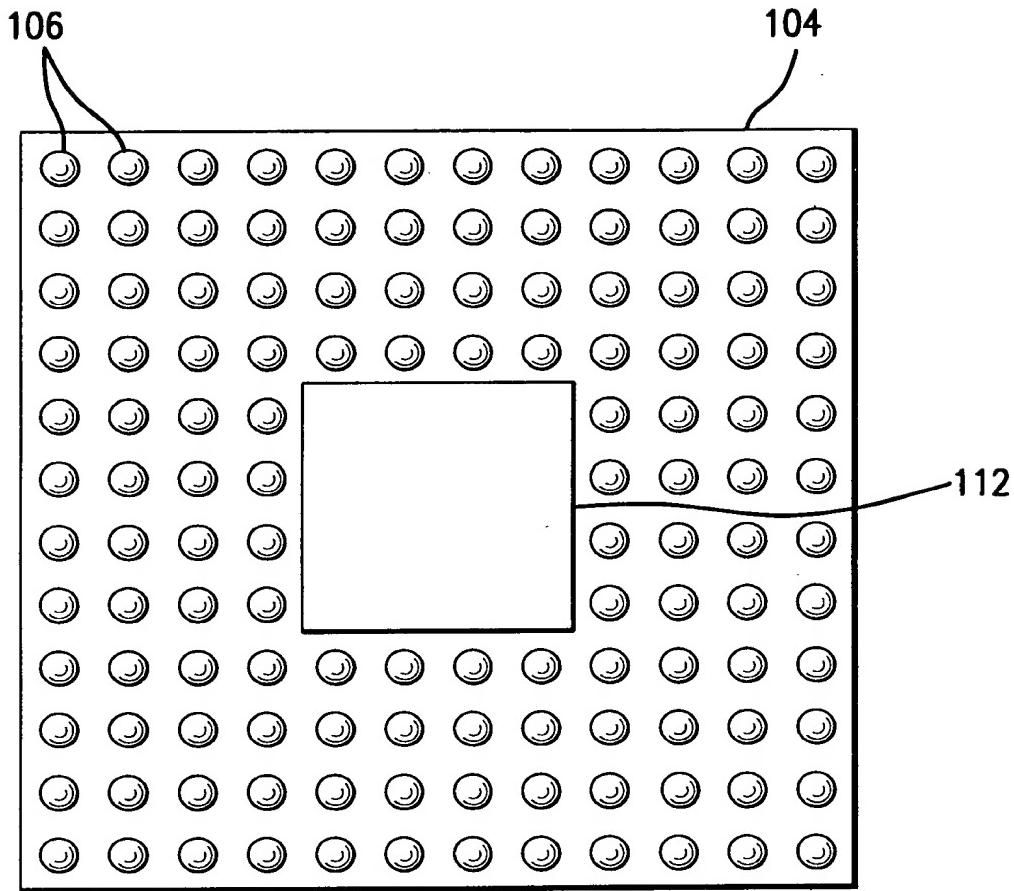


FIG. 4

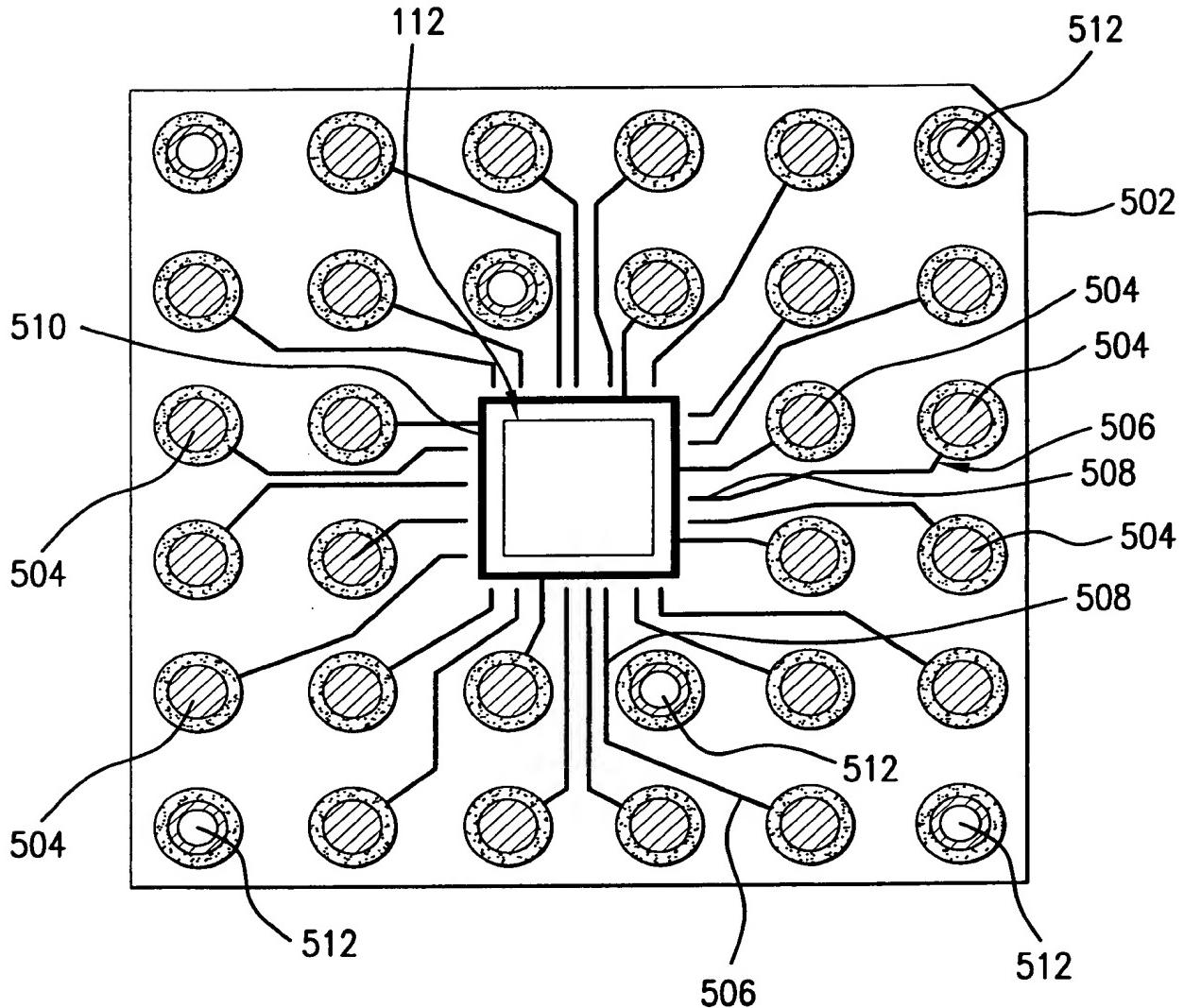


FIG. 5



600

602

A SUBSTRATE IS PROVIDED THAT HAS A FIRST SURFACE AND A SECOND SURFACE, WHEREIN THE SUBSTRATE HAS A CENTRAL WINDOW-SHAPED APERTURE THAT EXTENDS THROUGH THE SUBSTRATE FROM THE FIRST SUBSTRATE SURFACE TO THE SECOND SUBSTRATE SURFACE

A STIFFENER/HEAT SPREADER IS PROVIDED

604

A SURFACE OF THE STIFFENER/HEAT SPREADER IS ATTACHED TO THE FIRST SUBSTRATE SURFACE, WHEREIN A PORTION OF THE STIFFENER/HEAT SPREADER IS ACCESSIBLE THROUGH THE CENTRAL WINDOW-SHAPED APERTURE

A FIRST SURFACE OF AN IC DIE IS MOUNTED TO THE ACCESSIBLE PORTION OF THE STIFFENER/HEAT SPREADER

606

A SURFACE OF A DROP-IN HEAT SPREADER IS MOUNTED TO A SECOND SURFACE OF THE IC DIE

608

610

FIG. 6